

"INTRODUCTION TO GEOTHERMAL AND ITS BUSINESS PROCESSES: THE OPPORTUNITIES, ECONOMICS, EXPLORATION AND PRODUCTION"

- Dampak Lingkungan dan Sustainability Reporting

Dr. Ir. Sugeng Riyono, M.Phil.

Jakarta-25-26 September 2021

✓ SAVE THE DATES



PELATIHAN MEDIA

Pengenalan Panas Bumi dan Bisnis Prosesnya

KEYNOTE SPEAKERS*



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25 - 26 September 2021
09.00 - 18.00 WIB (GMT+7)
Online via ZOOM



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ASPERMIGAS

INSTRUCTORS

Pelatihan khusus untuk jurnalis dan media yang secara komprehensif akan memberikan pengenalan industri dasar panas bumi (geothermal) dengan materi berupa :

- Potensi panas bumi dan energi terbarukan di Indonesia sebagai bagian dari sustainability development goals (SDG)
- Pengenalan dan sejarah panas bumi di Indonesia
- Rantai pasokan bisnis panas bumi & faktor keekonomian panas bumi
- Dampak lingkungan dan sustainability reporting
- Energy outlook 2021



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DAN MENANGKAN HADIAH
JUTAAN RUPIAH

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Catatan:

- Prioritas pelatihan ini ditujukan untuk insan media/wartawan
- Peserta dapat mengikutinya secara mandiri atau setelah mendapatkan persetujuan panitia



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Lulusan/Graduated dari Institut Teknologi Bandung, Petroleum Engineering Department, 1986.

Master Degree/S2: Heriot Watt University, Edinburgh, Scotland, United Kingdom in Petroleum Engineering, 1994, Mater of Philosophy (M Phil).

Doctor Degree: Institut Teknologi Bandung, Petroleum Engineering, Enhanced Oil Recovery. 2019.

Pengalaman Kerja / Works Experience:

LEMIGAS R & D Centre, Jakarta:

- Quality, Health, Safety and Environment (QHSE) Head/Coordinator : 2007-2012
- Coordinator of Research Group and Laboratory Services Upstream-Downstream (2012-2018)
- Research Studies and Consulting: O&G & Geothermal fields, QHSE Standards Compliancy and Implementations AMDAL & UKL/UPL Studies 2010-2018.
- Developed and maintained implementation of Gap Analysis & Management System of OHSAS 18001 and ISO 14001.
- Consultant/Expert of O&G and Geothermal Companies.



- Lecturer at University: Institut Sains dan Teknologi Al-Kamal Jakarta (Mechanical Engineering, Industrial Engineering, and Head of QMS Institute; Universitas Proklamasi 45 Yogyakarta (Petroleum Engineering, and Dean of Engineering Faculty) 2020-2021.

International Activities:

- Global Methane Initiative (GMI) Sub Committee Indonesia Representative for GMI US-EPA 2014-2018,
- UNECE – Expert on Gas and Global Methane Initiative Conference, Geneva 25-27 March 2019;
- Coordinating Committee for Geoscience Programme (CCOP) in East and South East Asia. Bangkok, Thailand, as National Coordinator for Oil and Gas Sector 2015-2018,
- Lemigas-Kogas study of Coal Bed Methane (CBM) Research Program, Special Study, 2016-2018;
- International Programs Activity National Coordinator of Carbon Capture Utilization and Storage (CCUS)

Memberships:

- IATMI : Ikatan Ahli Teknik Perminyakan Indonesian (Indonesia Petroleum Engineer Association)
- INAGA : Indonesian Geothermal Association
- INDOCOR : Indonesian Corrosion Association,
- SPE : Society of Petroleum Engineer, member;
- GMI: Global Methane Initiative as Expert for Sub-Committee Country Coordinator, Country Coordinator
- NCSR-E: National Center for Sustainability Reporting-Energy Sector, Chairman, 2018-Now.



Materi Bahasan:

1. Introduction – Climate Change Policy
2. Commitment - Geothermal Operations Sustainability
3. Sustainability Indicators
4. Setting Standards for Sustainability
5. Environmental Compliance
6. Sustainability Reporting
7. Closing



Activity Location, interrupted harmony





Materi Bahasan:

1. Introduction – Climate Change Policy

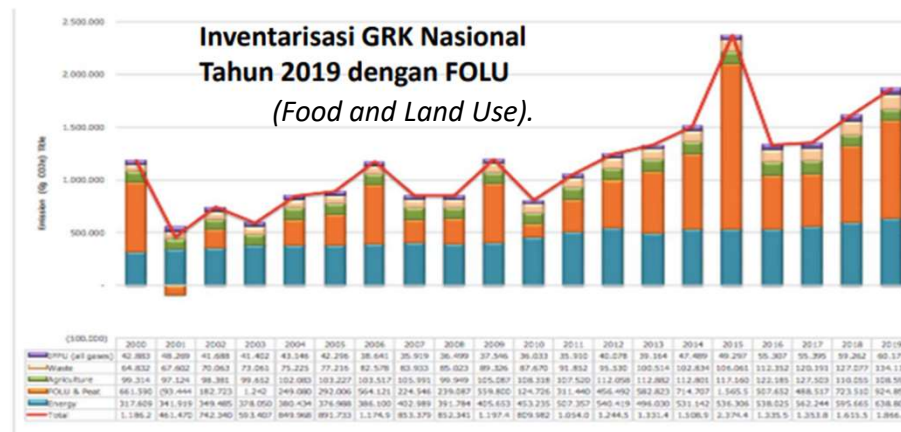
CLIMATE CHANGE POLICY

2020 was an important year for climate change policy commitments.

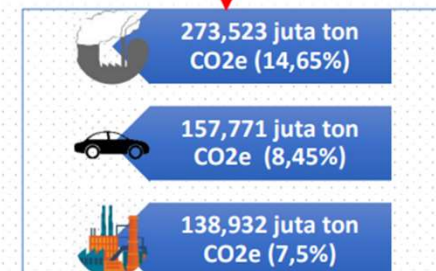
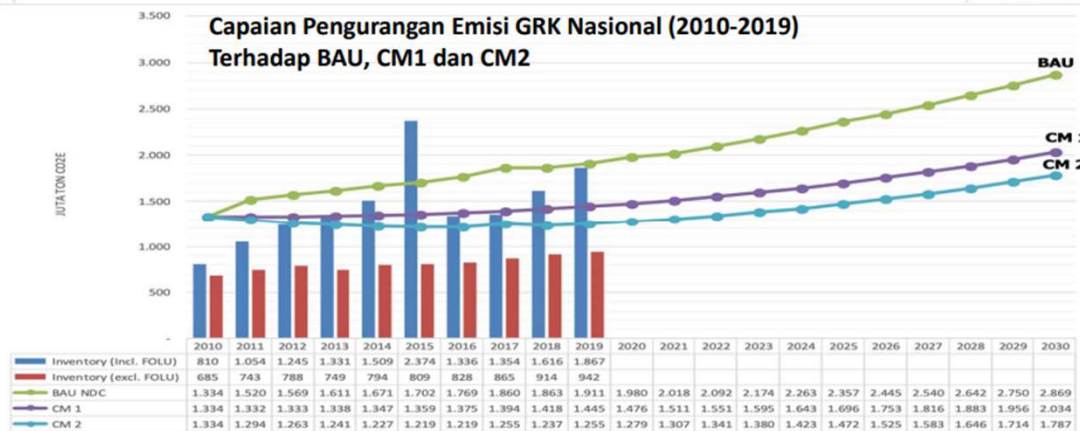
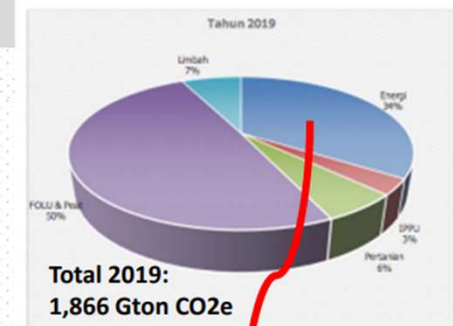
Although the COVID-19 crisis was the central political focus of the year, commitments to climate change mitigation stood out. Overall, 2020 was an important milestone for climate change policy, as many countries' greenhouse gas targets for the year expired. Countries set new targets, and many committed to carbon neutrality.

While some jurisdictions enacted climate change policies that indirectly stimulate the uptake of renewable energy, a growing number adopted comprehensive policies directly linking decarbonisation with increased deployment of renewables. Policy mechanisms implemented in 2020 that can indirectly stimulate interest in renewable energy included fossil fuel bans and phase-outs, greenhouse gas emission reduction targets, and carbon pricing and emission trading systems. In addition, at least six regional, national and state/provincial governments adopted comprehensive, cross-sectoral climate policies that include direct support for renewables.

Adaptation Pathways



IMPLEMENTASI NDC



Paris Agreement:

Nationally Determined Contribution (NDC)

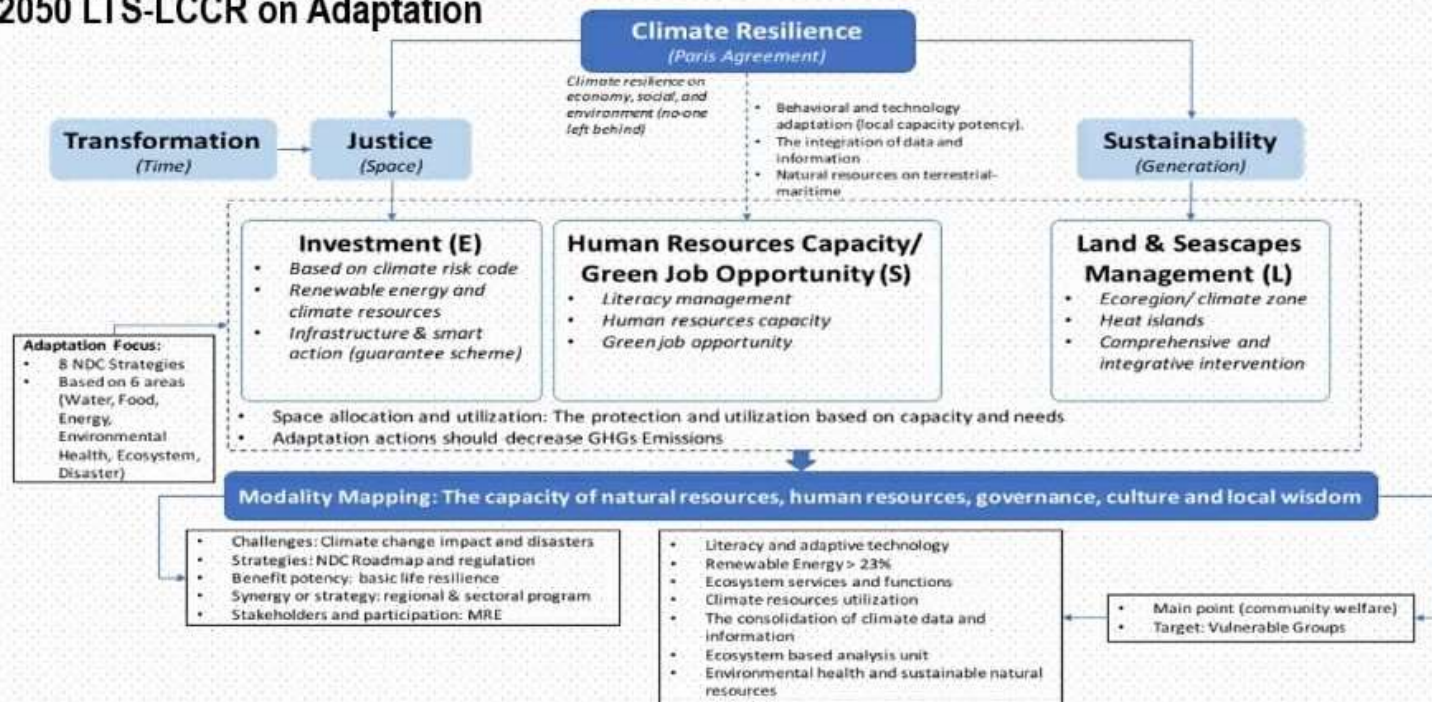
The First NDC Indonesia, Updated NDC, LTS-LCCR 2050



Adaptation Pathways

Long-term Strategy on Low Carbon and Climate Resilience

The scheme 2050 LTS-LCCR on Adaptation



Climate resilience in accordance with the direction of the Paris Agreement is translated into economic, social and environmental res with the principle of no-one left behind. The strategy towards climate resilience is carried out by means of investment, human reso capacity / green job opportunity, and land & seascape management.



Law No. 32/2009 regarding Environmental Protection and Management with its objectives to protect environmental function sustainability, enforce the wise use of natural resources, achieve sustainable development and anticipate global environmental issues, has provided a strong legal basis for the development of **long-term strategy on low carbon and climate resilience (LTS-LCCR)**.

“Under the LTS-LCCR 2050, Indonesia seeks opportunities for international partnerships to support sustainable transition towards low carbon economy and green recovery post COVID-19 pandemic as well as global justice. We believe this would be an opportunity to start a transition phase which will lead to transformation of our whole economy, social and environmental development”. (Joko Widodo)



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Sustainability Business Commitment

Upaya berkesinambungan yang telah dan akan terus dilakukan untuk membangun keberlanjutan Perusahaan, yaitu melalui terciptanya sinergi harmonis antara aspek ekonomi (profit), lingkungan (planet), dan sosial (people).

Perusahaan juga akan terus melanjutkan beragam upaya untuk mendukung Tujuan Pembangunan Berkelanjutan (Sustainable Development Goals).

Jalan yang kami tempuh akan bermuara pada terciptanya Perusahaan yang berkontribusi dalam mewujudkan masa depan yang lebih cerah dan nilai berkelanjutan tidak hanya untuk diri sendiri, tetapi juga para pemangku kepentingan bangsa Indonesia dan dunia.



Sustainability in geothermal operation is based on a novel hybrid techno-economic model for geothermal power plants with endogenized plant lifetime, investigates the economic feasibility of a sustainable exploitation of geothermal resources for electricity generation.

To this end, standard terminology and classifications from the literature are reviewed, such as “sustainability”.



An illustrative conventional, convective high-enthalpy hydrothermal system is contrasted with an enhanced, conductive low-enthalpy petrothermal system. Furthermore, different (mostly geophysical) sustainable operation criteria for the use of geothermal energy are derived from the literature.

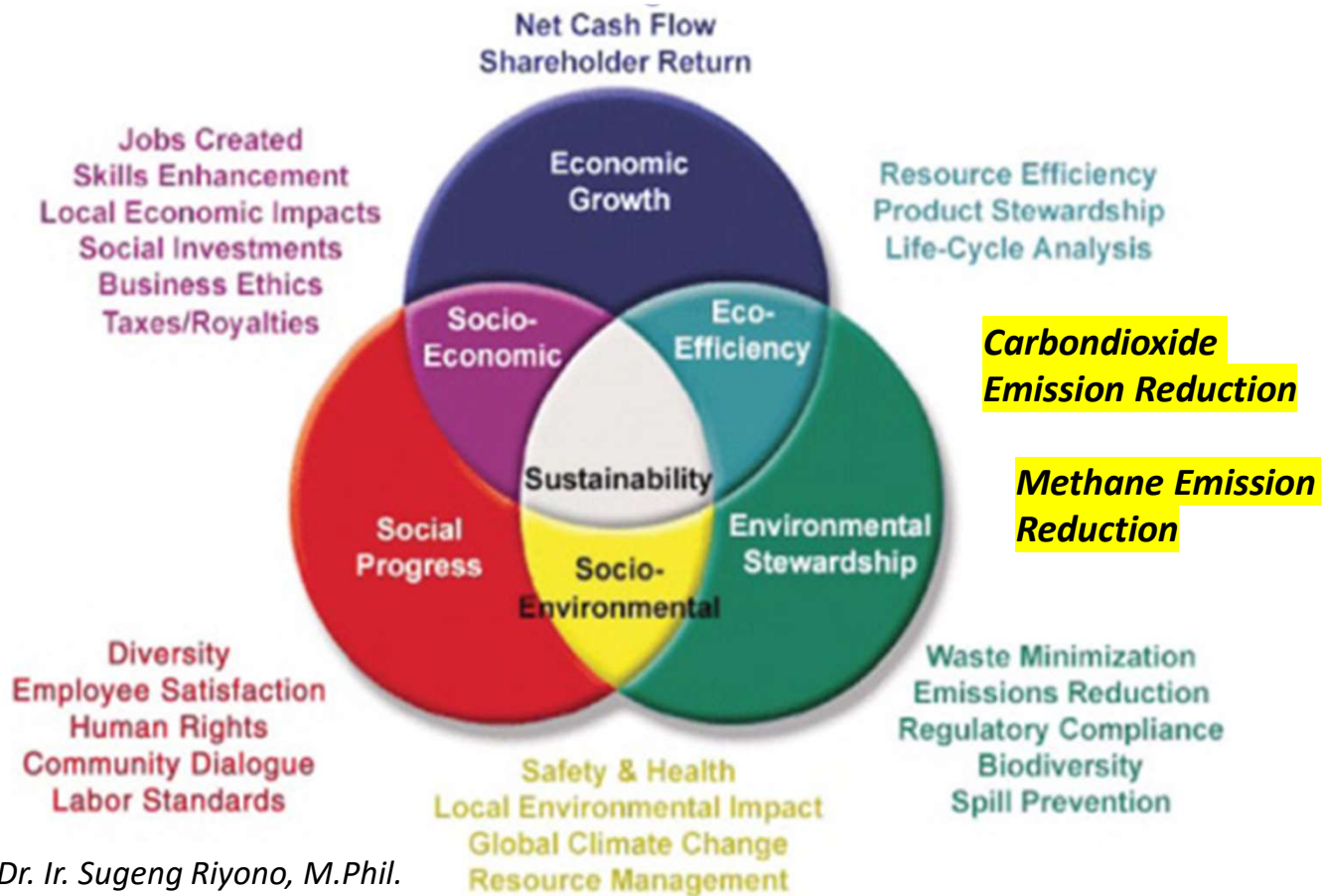


The conditions for complying with these criteria are compared with the economic criteria of cost minimization (levelized cost of electricity, LCOE) and profit maximization (net present value, NPV), respectively, revealing differences that vary in intensity, particularly depending on the type of reservoir and their respective properties.

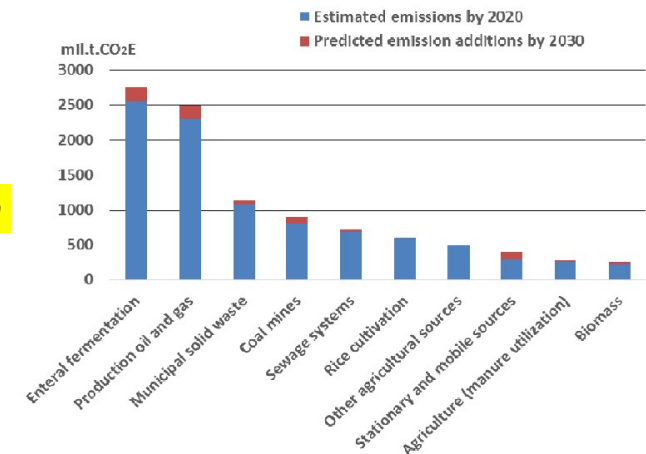


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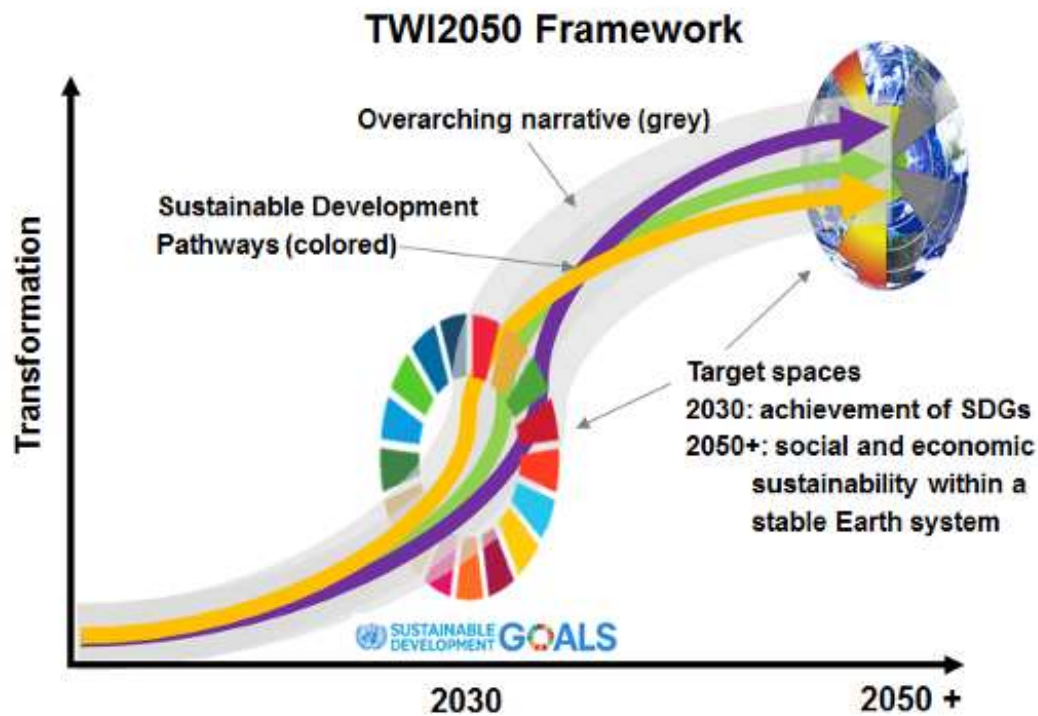
1. Introduction – Climate Change Policy
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SUSTAINABLE DEVELOPMENT GOALS Indicators



The World In 2050



indicators

SUSTAINABLE DEVELOPMENT GOALS



03 - 05 April 2017

Laxenburg Conference Center, Laxenburg, Austria

Dr. Ir. Sugeng Riyono, M.Phil.



indicators

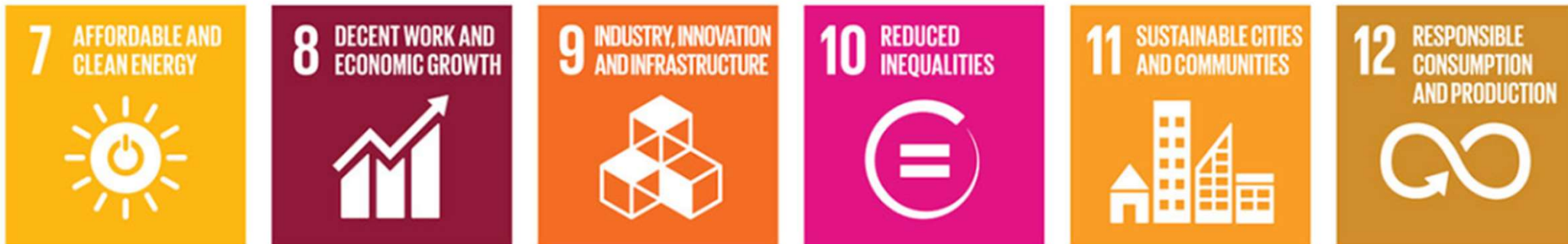
SUSTAINABLE DEVELOPMENT **GOALS**





indicators

SUSTAINABLE DEVELOPMENT GOALS



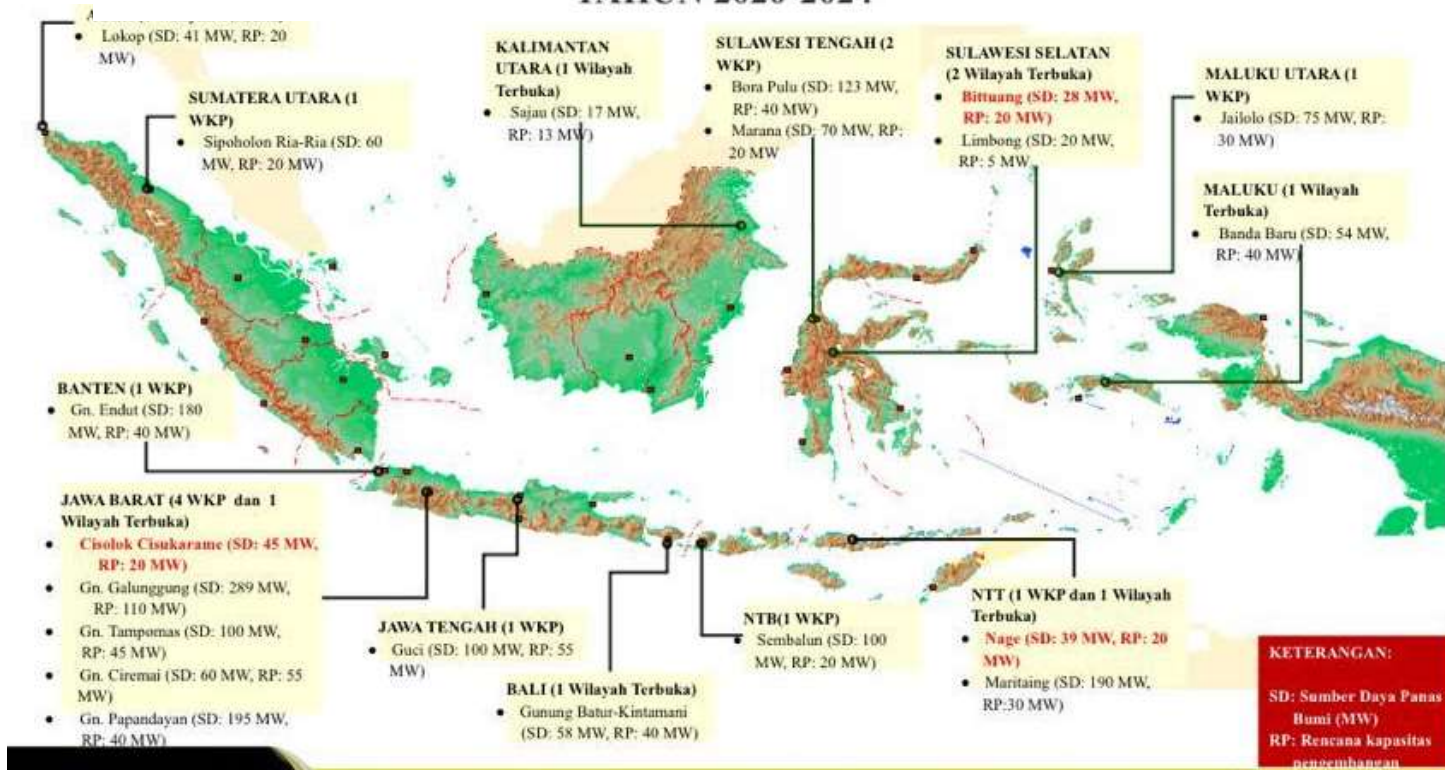


indicators

SUSTAINABLE DEVELOPMENT **GOALS**



RENCANA WILAYAH EKSPLORASI PANAS BUMI OLEH PEMERINTAH TAHUN 2020-2024



indicators

SUSTAINABLE DEVELOPMENT GOALS

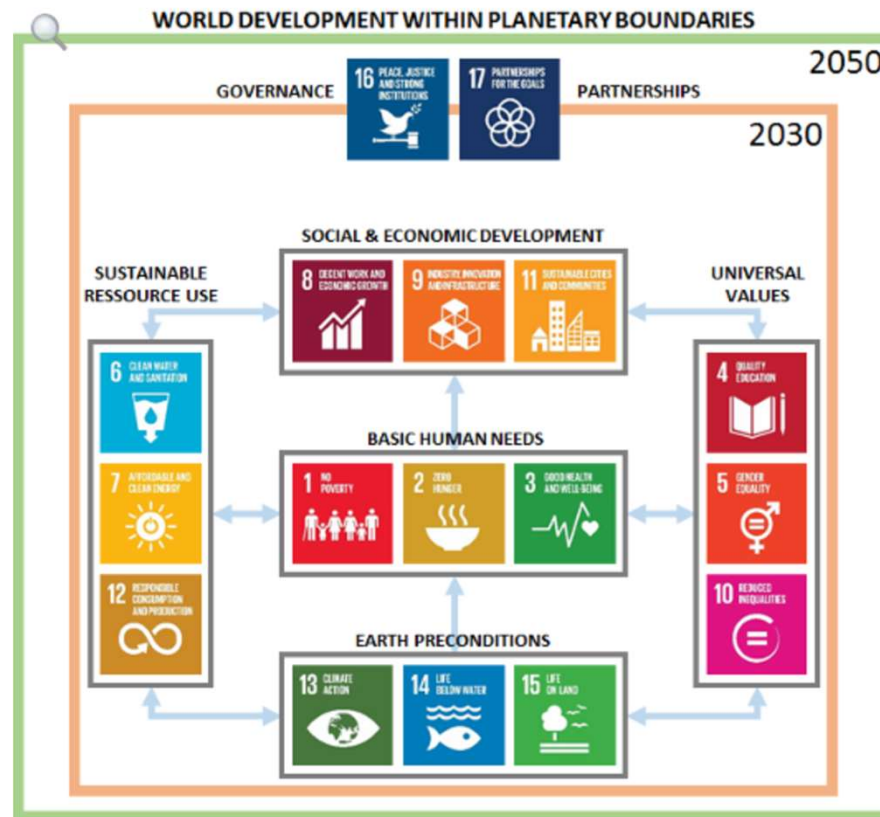


Figure 2. The World in 2050 [TWI2050] framework for Sustainable Development



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Setting Standards for Sustainability



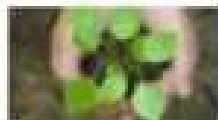
Risk assessment/due diligence



Management strategies



Sustainable events management systems



Environmental compliance



Strategic sustainability & CSR advice

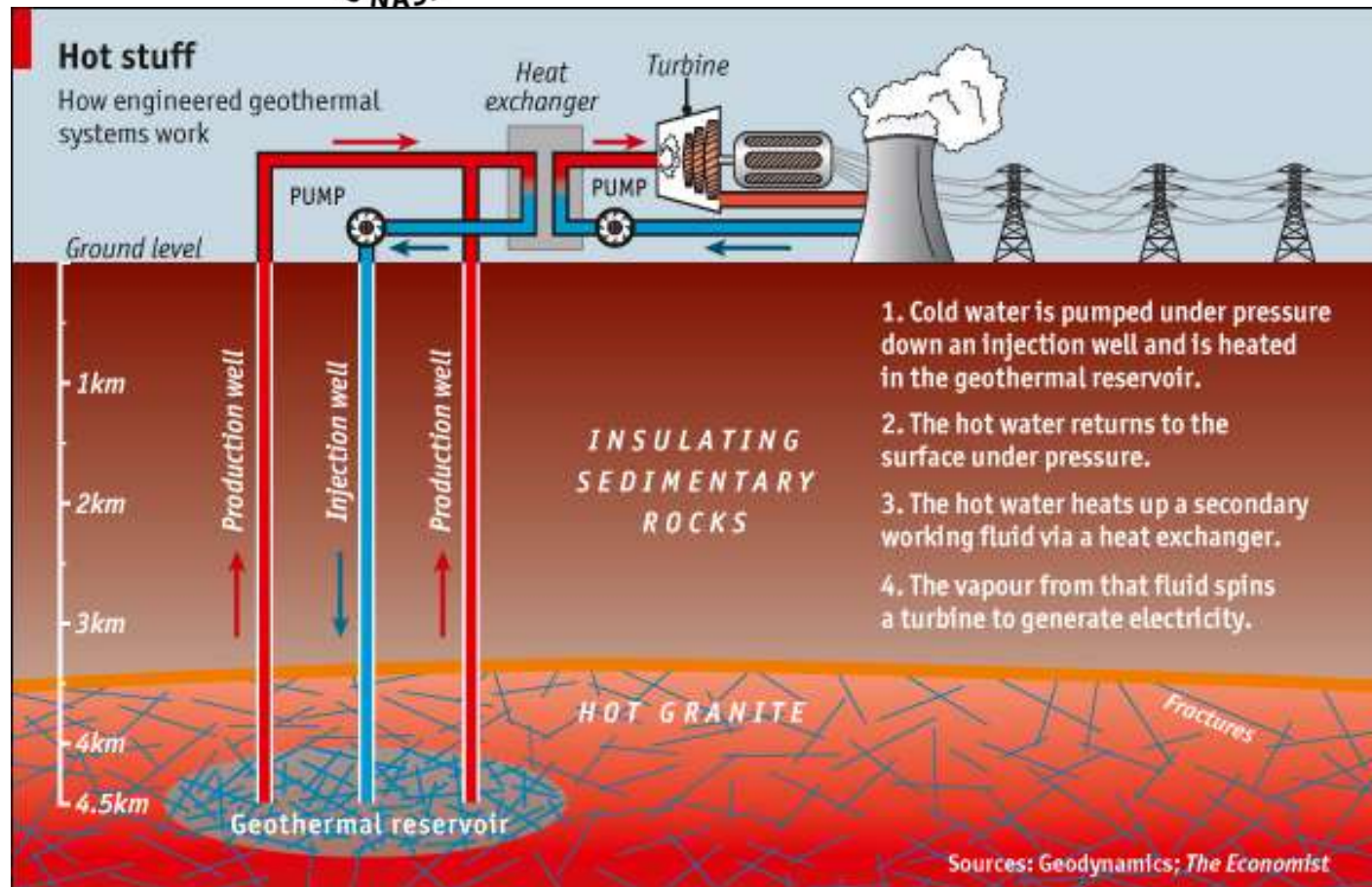


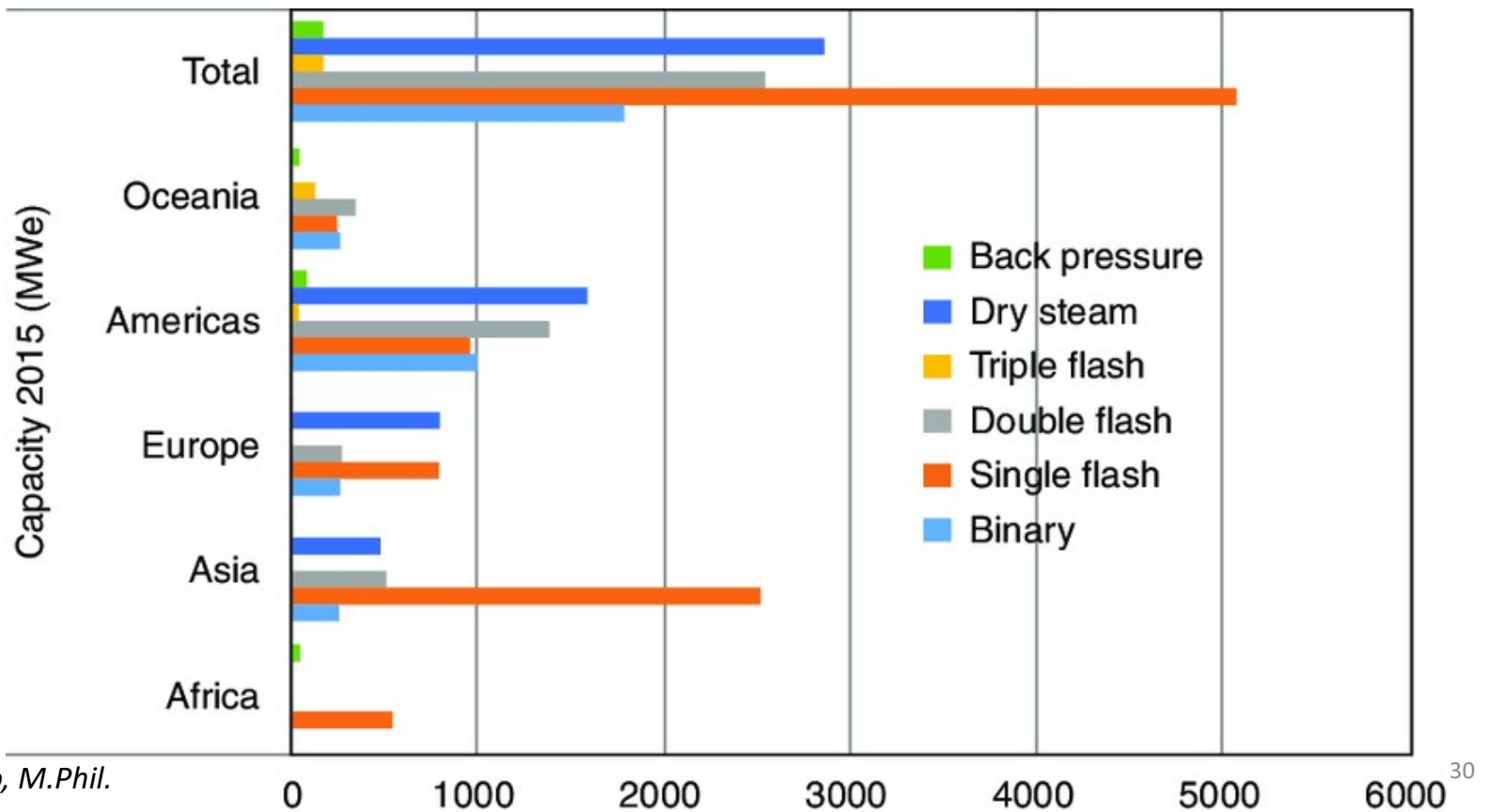
Sustainability in the supply chain



What is Sustainability Risk?

- Does your compliance model cover sustainability?
- How do you close the gap between financial and non-financial information?
- What are the risks of standards differing across the organisation?







Risk Management as a Stand-alone Exercise

- Is your compliance a tick box exercise?
- Does it check that policies and processes are sufficient to mitigate current and future risk?

Risk Assessment as main process of Sustainability

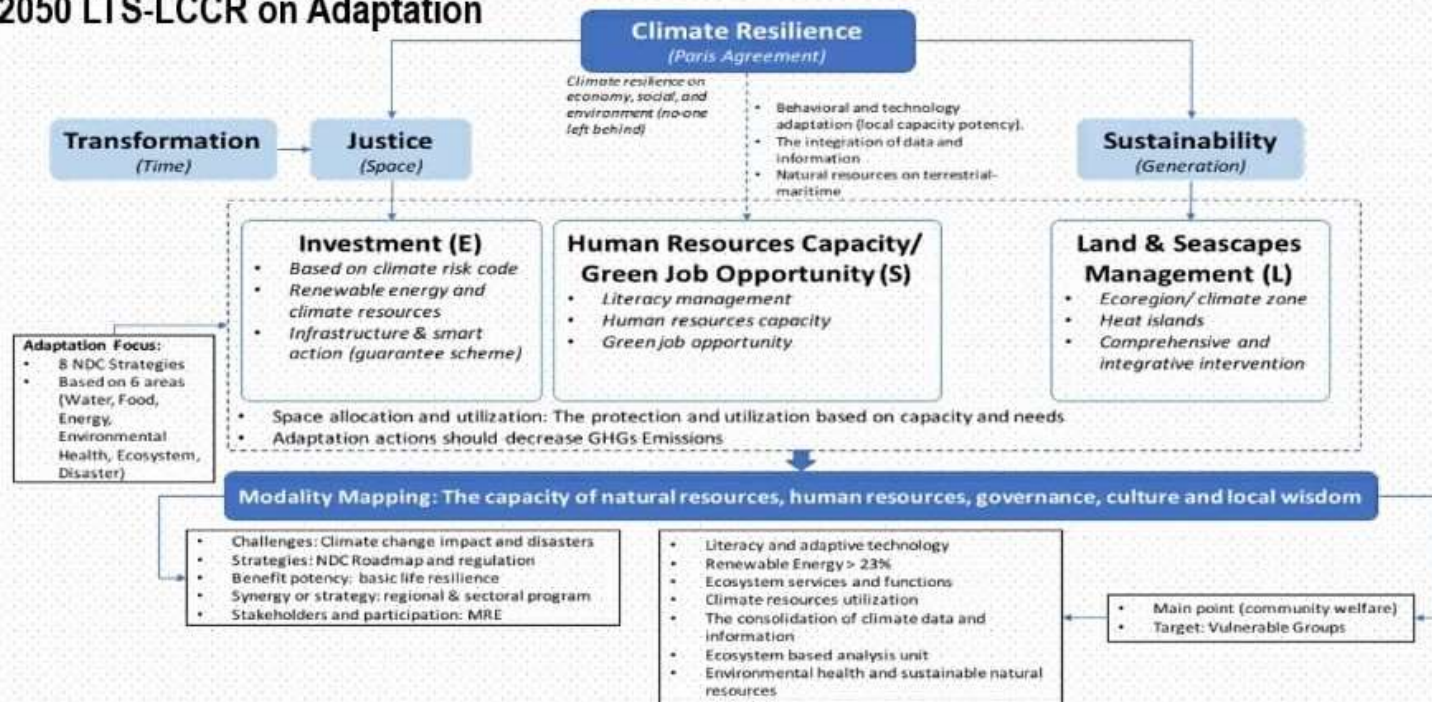
Consequence						Increasing Probability				
Severity Rating	People	Environment	Assets	Reputation	Social	A	B	C	D	E
						10^{-6} to 10^{-4} occurrence / year	10^{-4} to 10^{-3} occurrence / year	10^{-3} to 10^{-1} occurrence / year	10^{-1} to 1 occurrence / year	> 1 occurrence / year
						Rare occurrence	Unlikely occurrence	Credible occurrence	Probable occurrence	Likely occurrence
						Never heard of in the Global Industry	Heard of in the Global Industry	Incident has occurred	Happens several times per year	Happens several times per year
1	No/negligible health effect/injury	No effect	No damage	No impact	No impact					
2	Minor/Slight health effect/injury	Slight effect	Slight damage	Slight impact	Local impact	Manage for continuous improvement				
3	Major health effect/injury	Localised effect	Localized damage	Considerable impact	Regional impact			Incorporate risk reduction measures		
4	Permanent disability/up to 3 fatalities	Major effect	Major damage	National impact	National impact				Intolerable	
5	More than 3 fatalities	Massive effect	Extensive damage	International impact	International impact					

Integrating Risk Management into Strategy

- Is risk management a foundation to develop business strategy and enhance reputation?
- Does it identify opportunities to make policies and processes harmonised and best practice?
- How does your compliance strategy underpin your values?

Adaptation Pathways

The scheme 2050 LTS-LCCR on Adaptation



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Complementary research & share knowledge	Education / training
Standard geothermal resource & reserve definitions	Improved HTHF hard rock drill equipment
Predictive reservoir performance modelling	Improved HTHF multiple zone isolation
Predictive stress field characterization	Reliable HTHF slim-hole submersible pumps
Mitigate induced seismicity / subsidence	Improve resilience of casings to HTHF corrosion
Condensers for high ambient surface temperatures	Optimum HTHF fracture stimulation methods
Use of CO ₂ as a circulating fluid for heat exchangers	HTHF logging tools and monitoring sensors
Improve power plant design	HTHF flow survey tools
Technologies & methods to minimize water use	HTHF fluid flow tracers
Predict heat flow and reservoirs ahead of the bit	Mitigation of formation damage, scale and corrosion

Tab. 1 – Priorities for advanced geothermal research (HTHF: high temperature and high flow rate)

A New Model



Using Compliance to Determine Opportunity

- Learning from experience:
 - Value add
 - Non Marketing
 - Joined-up thinking
 - Establishing best practice
 - Innovation
 - Utilises engagement
 - Embeds values

A New Model

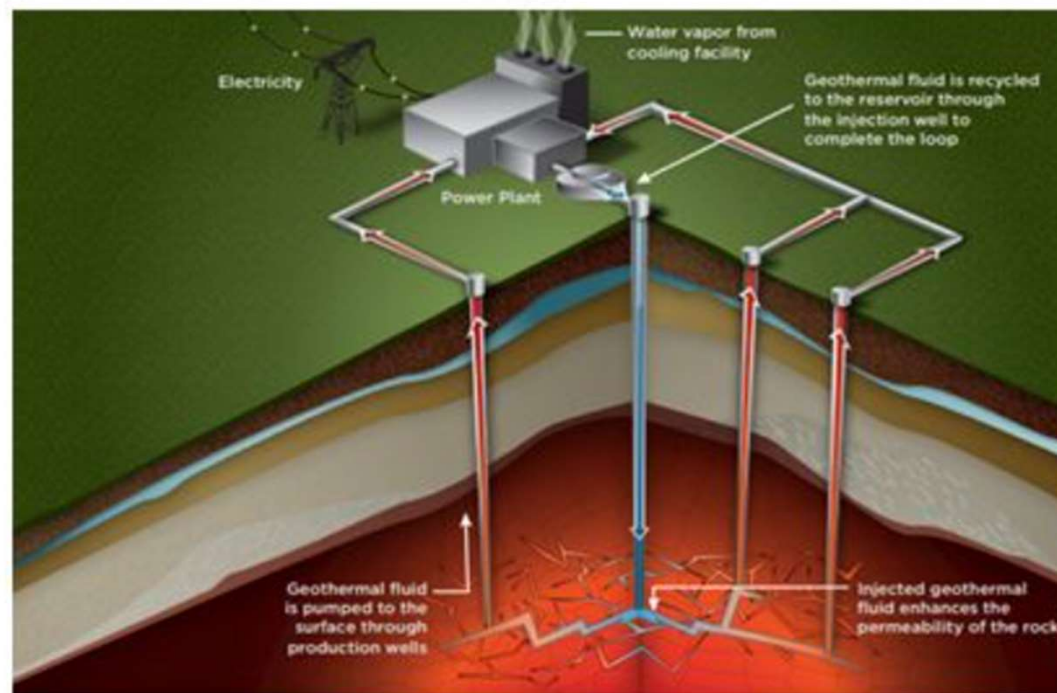


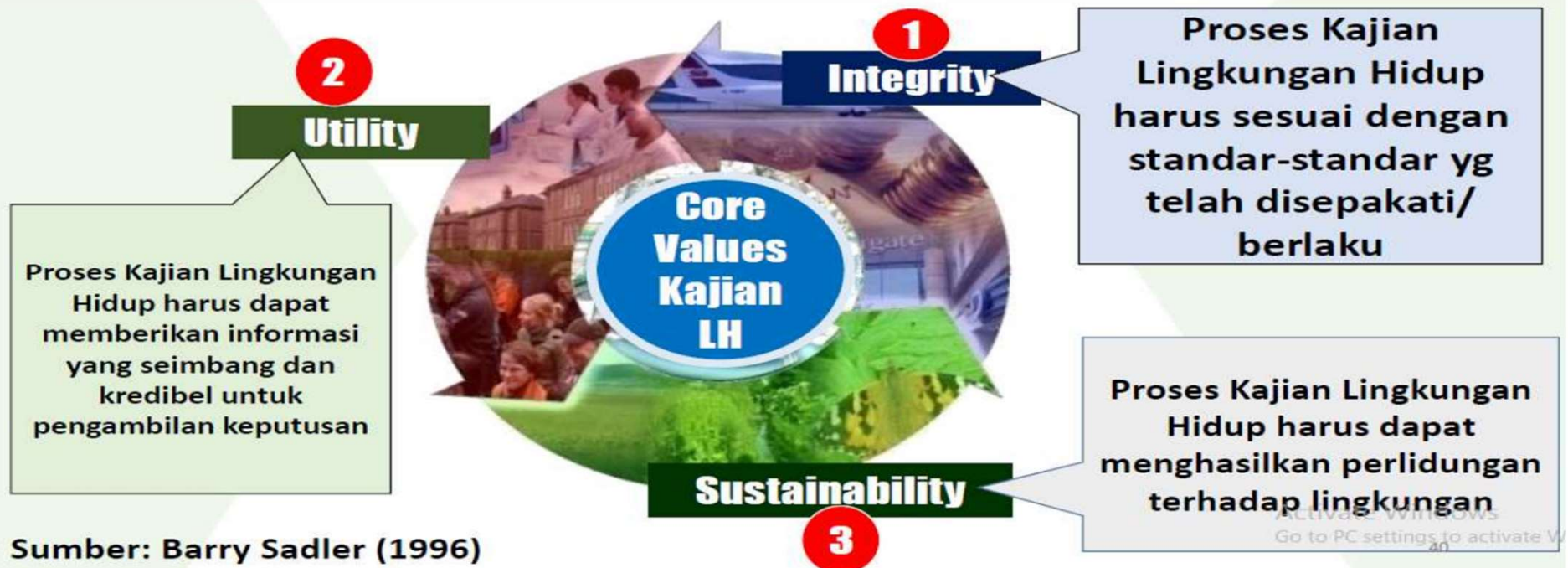
Fig. 2 Enhanced Geothermal System illustration (U.S. Department of Energy)



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Nilai-nilai Inti (Core Values) Kajian Lingkungan Hidup Untuk Mewujudkan Pembangunan yang Berkelanjutan dan Berwawasan LH



Pembangunan/Kegiatan Perekonomian dan Kedaulatan LH

Sesungguhnya masyarakat mempunyai hak untuk mendapatkan **Lingkungan Hidup yang baik dan sehat**. Hak tersebut dijamin dalam UUD dan peraturan perundang-undangan lainnya. Karena itu Kegiatan **Pembangunan/Kegiatan perekonomian harus dapat mewujudkan/menegakan Kedaulatan Lingkungan Hidup (Ekokrasi) → MENCIPTAKAN LH YANG BAIK DAN SEHAT**



1

UUD 1945 Pasal 28 H ayat (1): “Setiap orang berhak hidup sejahtera lahir dan batin, bertempat tinggal dan mendapatkan **lingkungan hidup yang baik dan sehat** ...”



2

Pasal 65 UU 32/2009: “Setiap orang berhak atas lingkungan hidup yang baik dan sehat sebagai bagian dari hak asasi manusia”

Apa Kajian Lingkungan Hidup (Environmental Assessment)

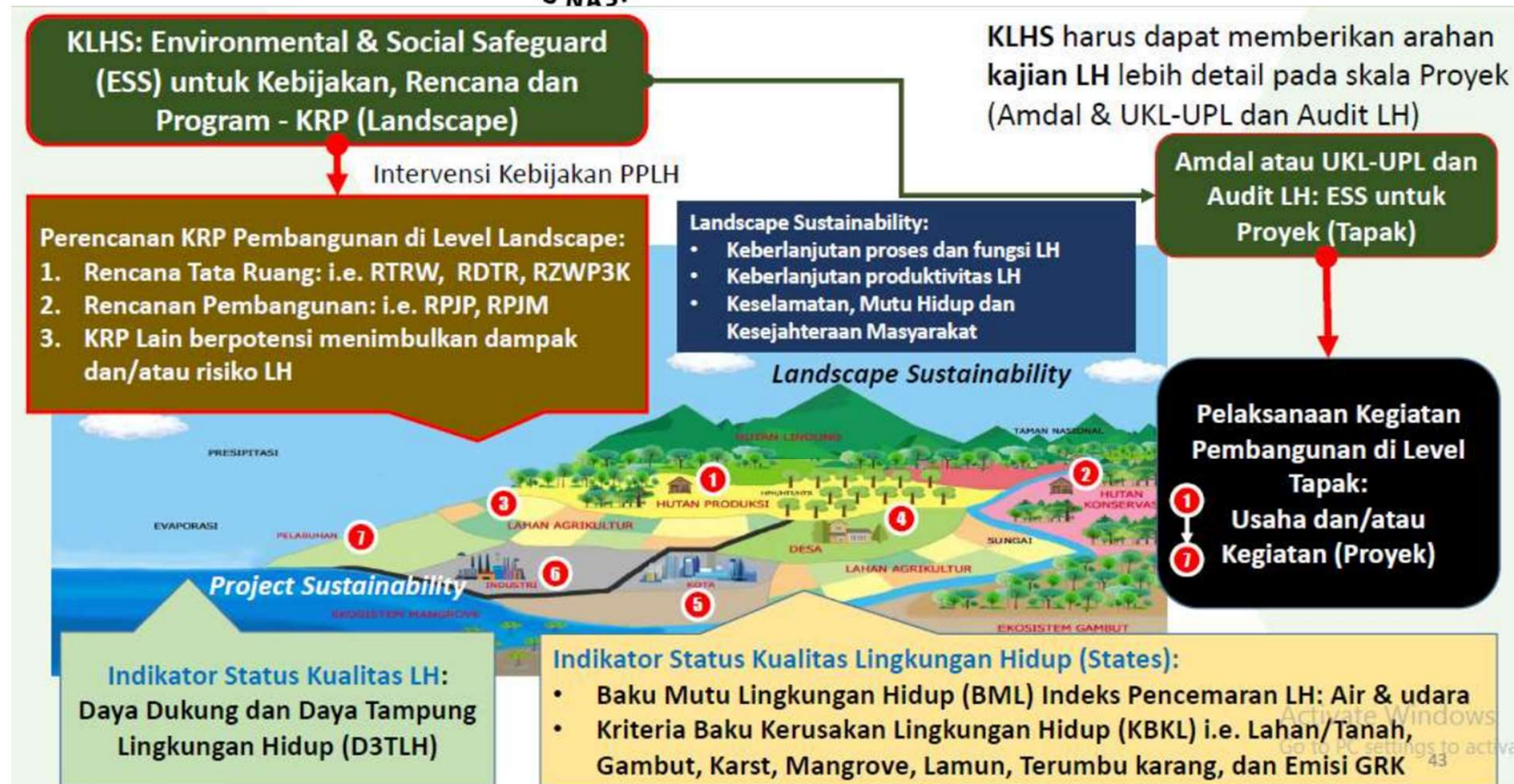
KAJIAN LINGKUNGAN HIDUP - *ENVIRONMENTAL ASSESSMENT*:

- Proses dimana **konsekuensi** dan **dampak lingkungan hidup** dari berbagai proses alami dan kegiatan manusia **diestimasi, dievaluasi dan diprediksi**;
- Kajian tersebut mencakup **cara-cara untuk minimalisasi, mitigasi atau eliminasi** atau **kompensasi** terhadap berbagai **dampak lingkungan** yang terjadi;
- Berbagai **program tindak lanjut** untuk melakukan **verifikasi** terkait dengan **akurasi kajian lingkungan hidup** dan **efektivitas** berbagai **rencana mitigasi** juga merupakan bagian dari lingkup kajian lingkungan hidup

Sumber:

Ling et al, 2015. Introduction to environmental assessment. Cambridge: The United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC).

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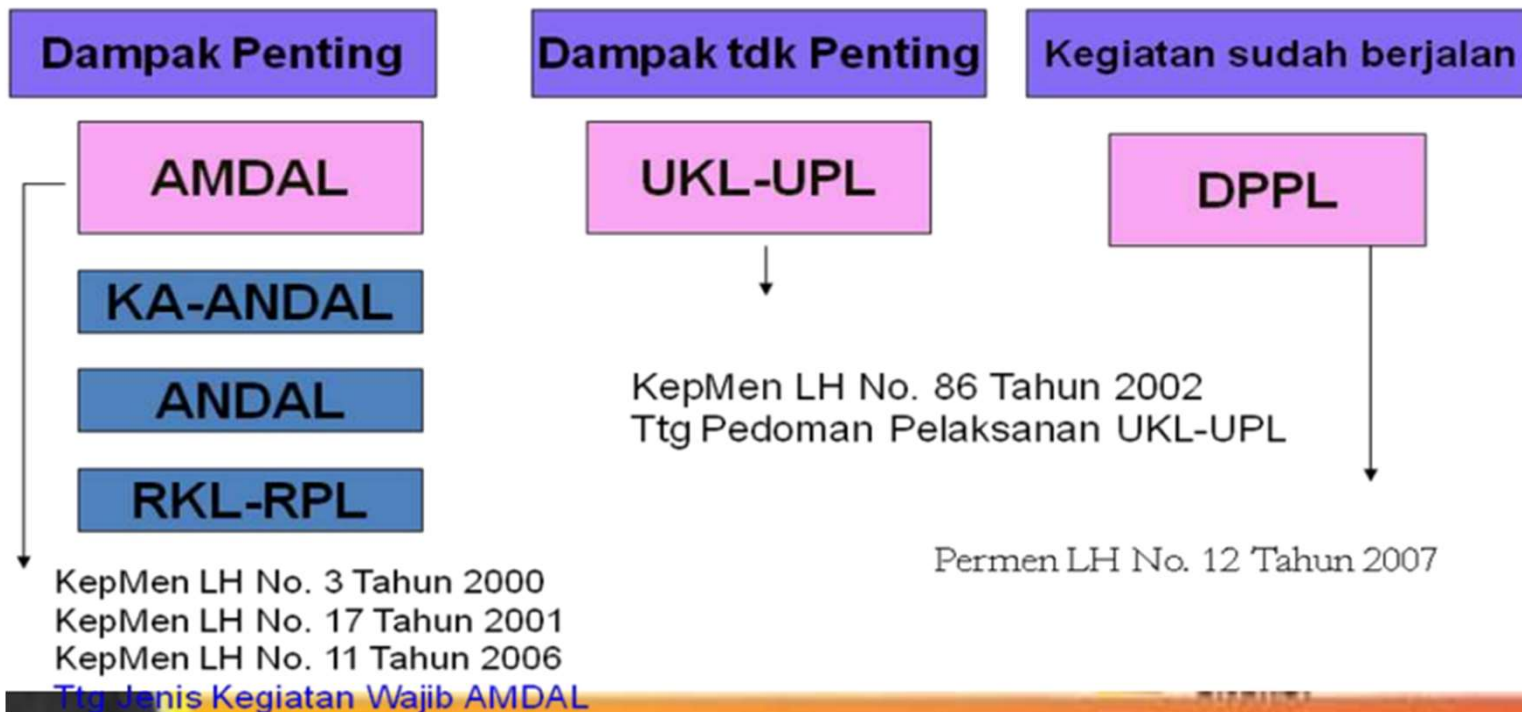


Source: Partidario, 2000

Pembagian Jenis Usaha dan/atau Kegiatan Berdasarkan Dokumen LH

Jenis Rencana Usaha dan/atau kegiatan	Dampak Lingkungan dan Dokumen Lingkungan
USAHA DAN/ATAU KEGIATAN WAJIB AMDAL Pasal 22-33 UU 32/2009	Kegiatan <u>berdampak penting</u> terhadap LH  Peraturan MENLH No 05/2012 Batas AMDAL
USAHA DAN/ATAU KEGIATAN WAJIB UKL/UPL Pasal 34 UU 32/2009	Kegiatan <u>tidak berdampak penting</u> terhadap LH  Batas dokumen UKL-UPL Peraturan Gub. atau Bupati/Walikota
USAHA DAN/ATAU KEGIATAN WAJIB SPPL Pasal 35 UU 32/2009	Kegiatan tidak wajib UKL/UPL & tidak berdampak penting serta Kegiatan <u>usaha mikro dan kecil</u> SPPL Tidak Wajib Memiliki Izin Lingkungan

PP No. 27 Tahun 1999 Tentang AMDAL



AMDAL

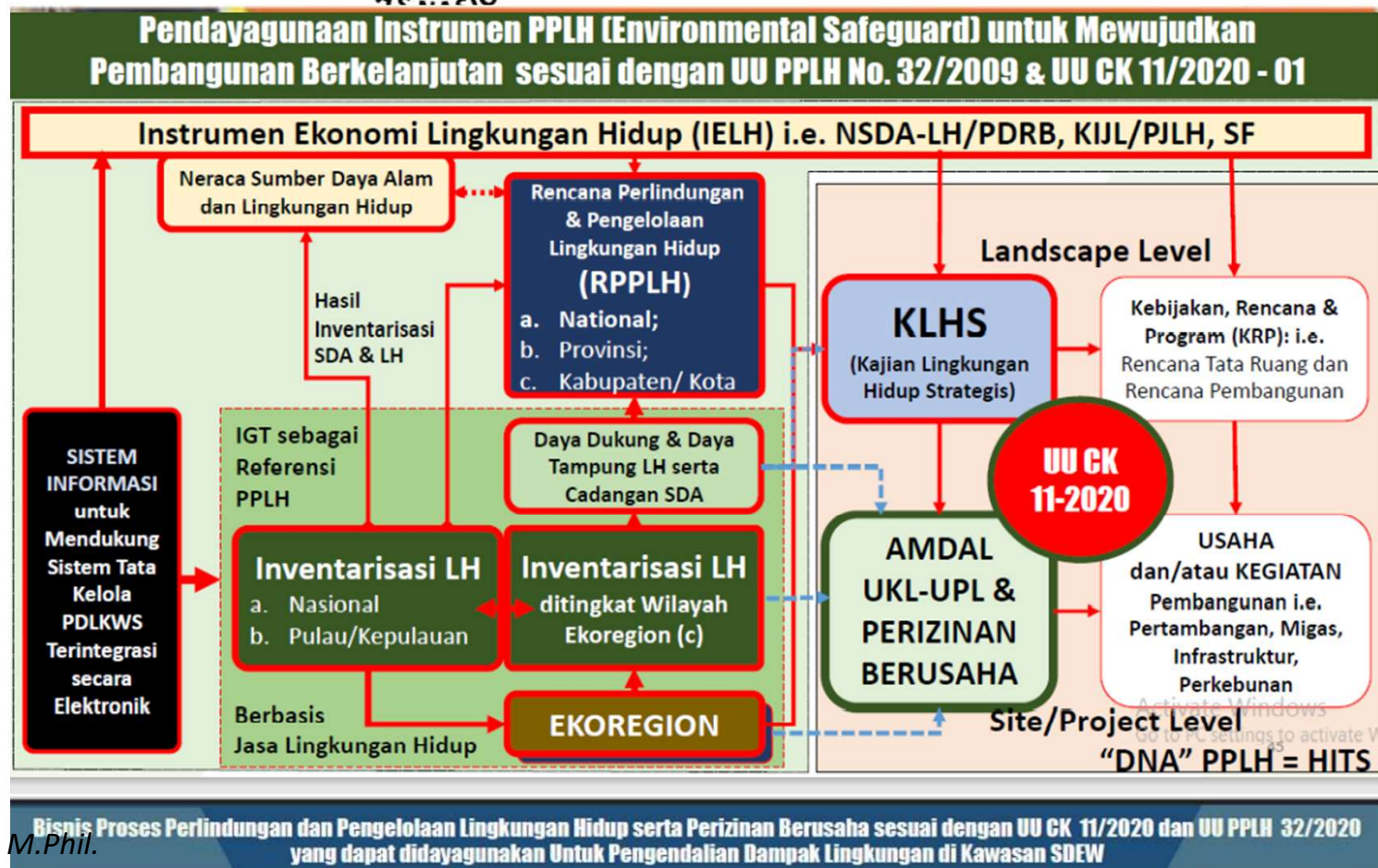
1. Usaha dan/atau kegiatan



2. Pengumuman keputusan kelayakan lingkungan (pasal 39) :

Perubahan frasa "pengumuman dilakukan dengan cara yang mudah diketahui masyarakat" .

- ✓ Keputusan kelayakan lingkungan di umumkan kepada masyarakat
- ✓ perubahan pasal 39 menjelaskan bahwa pengumuman kelayakan lingkungan dilakukan melalui system elektronik dan atau cara lain yang ditetapkan oleh pemerintah.
- ✓ Cara lain yang ditetapkan oleh pemerintah berarti membuka ruang penyampaian dengan cara yang paling mudah disuatu daerah tertentu termasuk mudah diketahui oleh masyarakat,





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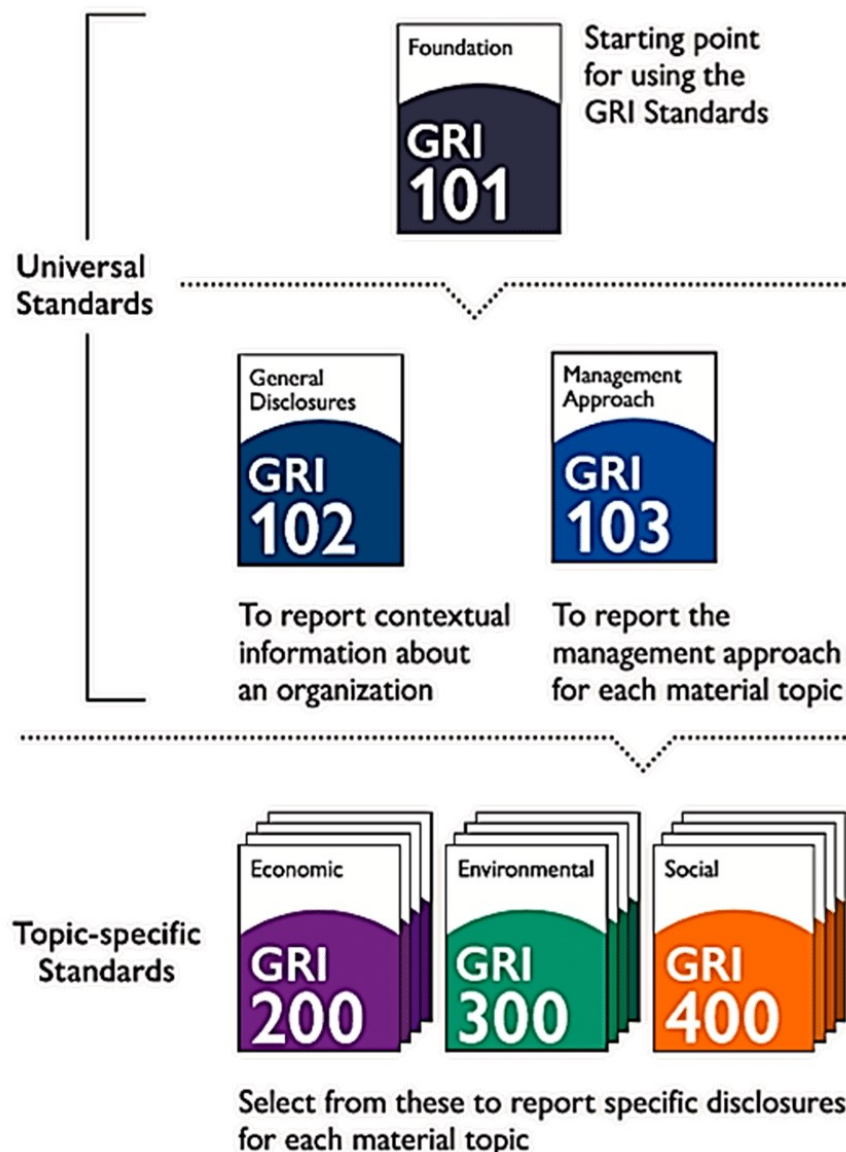


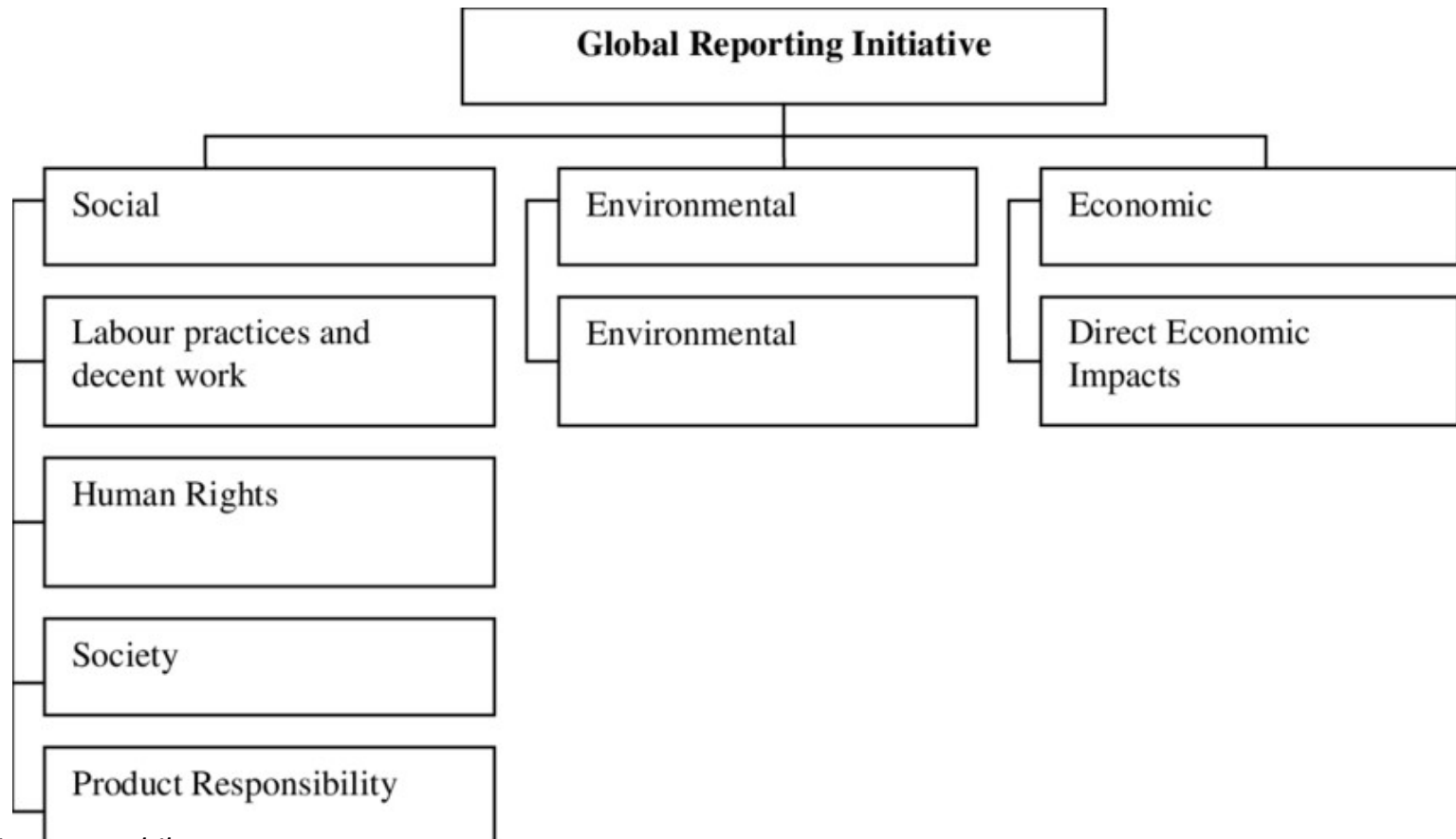
Sustainability Reporting

Sustainability Report (SR) adalah informasi perusahaan mengenai kinerja ekonomi, lingkungan dan pemerintah. Namun tidak hanya melaporkan dari data yang terkumpul, SR adalah metode untuk menginternalisasi dan memperbaiki komitmen organisasi terhadap pembangunan berkelanjutan dengan cara yang dapat ditunjukkan kepada pemangku kepentingan internal dan eksternal.



Global Reporting Initiative (GRI) adalah sebuah organisasi standar internasional yang independen. GRI selain membantu para pebisnis juga membantu pemerintah dan organisasi lain untuk mengerti dan mengkomunikasikan dampak bisnisnya dalam isu perubahan iklim, hak asasi manusia, juga korupsi.





CR performance of global forest product companies

- CR strategy
- CR reporting profile

- Economic responsibility
- Economic performance
 - Market presence
 - Indirect economic impacts

- Labour practice responsibility
- Employment
 - Labour/management relations
 - Occupational health and safety
 - Training and education
 - Diversity and equal opportunity

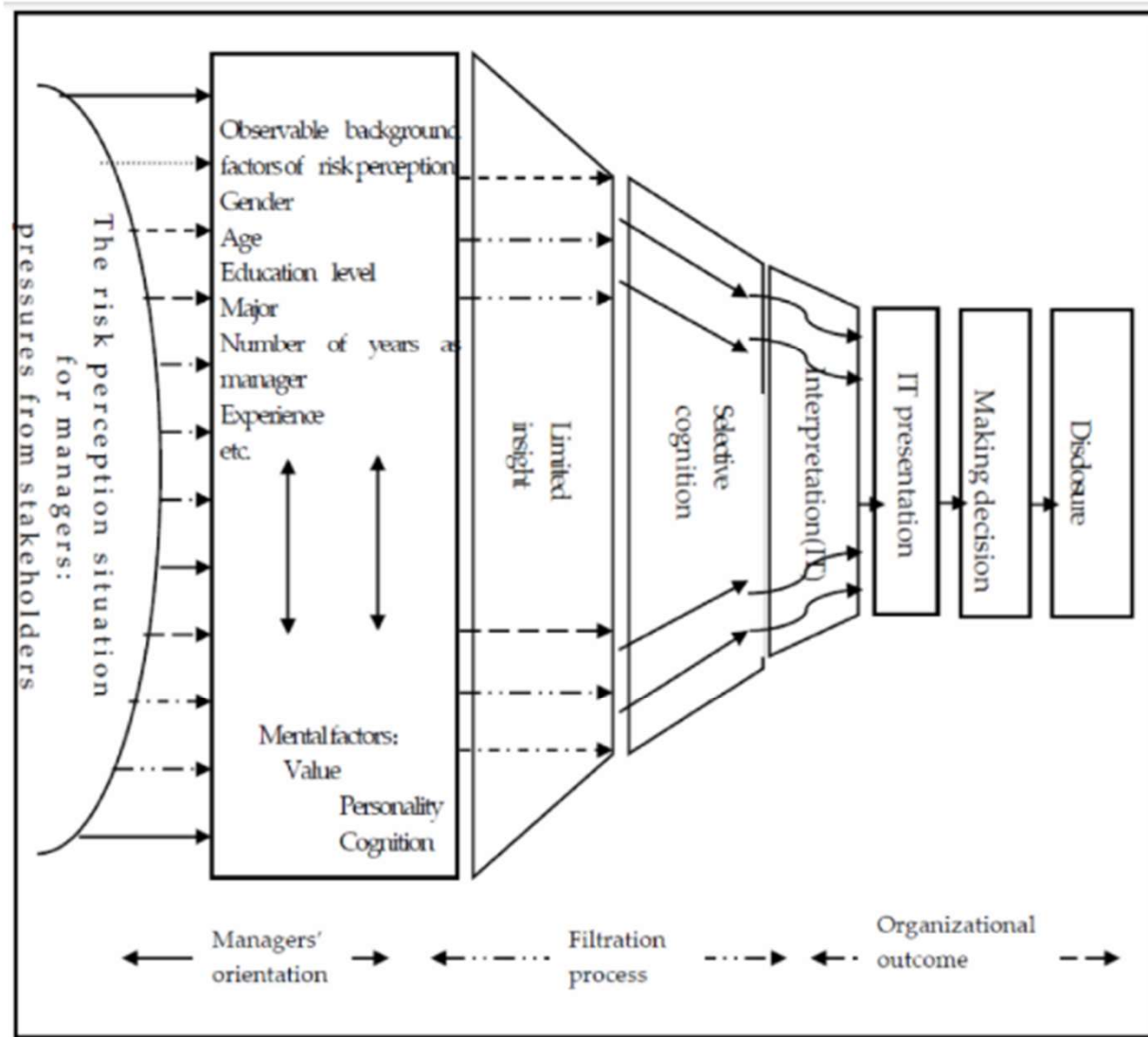
- Social responsibility
- Community
 - Corruption
 - Public policy
 - Anti-competitive behaviour
 - Compliance

- Environmental responsibility
- Materials
 - Energy
 - Water
 - Biodiversity
 - Emissions, effluents and waste
 - Product and services

- Human rights responsibility
- Investment and procurement practices
 - Non-discrimination
 - Freedom of association and collective bargaining
 - Child labour
 - Forced and compulsory labour
 - Security practices
 - Indigenous rights

- Product responsibility
- Customer health and safety
 - Product and service labelling
 - Marketing communications
 - Customer privacy
 - Compliance







What is the trend of development in Sustainability Reporting (SR)?

What we are seeing in SR is more and more different type of stakeholder. They starting to ask what is kind of data, then interesting about investors and frequently ask company for information about their sustainability performance before they decided where the actually invest.



What is the trend of development in Sustainability Reporting (SR)?

We also seeing trend among regulators and government, they also starting to requested, for instance document frequently to the listed company to provide non financial information as well as financial information.

Sustainability Governance

Through the Group Sustainability Policy, Sustainability Risk Management Framework and Sustainability Operating Model, Our Company enforces good sustainability governance.

The Group Sustainability Policy (GSP) outlines the Company's approach to sustainability (including its risk management). The GSP provides guidance on how sustainability risks should be managed. It is guided by five key principles:

- Ensure that the management of our internal operations and employees is consistent with our policies and position on various sustainability risks.
- Take appropriate measures to manage sustainability risks of our business activities and not engage in business activities that do not meet our policy requirements.
- Adopt an inclusive approach to our business relations and strive to positively influence their own sustainability performance and commitment.
- Engage actively and openly with our stakeholders, including suppliers on proactive management of sustainability risks and identification of opportunities for sustainable growth.
- Exercise due care and diligence to evaluate, adopt and advocate proactive measures to minimise and in the long-run prevent environmental harm, as well as promote social equity.

Sustainability Governance

Through the Group Sustainability Policy, Sustainability Risk Management Framework and Sustainability Operating Model, Our Company enforces good sustainability governance.

The Sustainability Risk Management Framework:

- identifies and assesses the various sustainability risk components, to include environmental, social, economic and ethical risks;
- defines the appropriate governance, which is supported by appropriate policies and procedures;
- puts in place risk assessment tools to improve the understanding of and preparedness against existing and emerging sustainability risks;
- ensures due diligence and assessment of sustainability risk impacts; and
- cultivates a risk management culture through the three-lines of defense, as well through the relevant controls and measurements for efficient/credible reporting.



Sustainability Governance

Through the Group Sustainability Policy, Sustainability Risk Management Framework and Sustainability Operating Model, Our Company enforces good sustainability governance.

Sustainability Operating Model:

- Our sustainability agenda is championed at the Group-level, to cover all businesses in our key operating markets. The Group Sustainability department and Group Sustainability Council are responsible for implementing the Sustainability Operating Model. While the CIMB Group Board is responsible for our sustainability performance, our Sustainability Sponsor provides guidance to the Board as well as the Management to continuously evolve and strengthen our sustainability strategies and implementation. [Click for a full list of our Board of Directors.](#)



GRI just release new version of standard, what is the main different with the previous?

When it come to the content itself, it's not really a lot of difference with before. But the main different is structure. So now rather than presenting everything in one bundle of guide lines, we separated it in individual standart like a modular structure.



GRI just release new version of standard, what is the main different with the previous?

It will easier for us to update individual standard, even add new standard as new topic become relevan in the field sustainability. And also make it easier for reporters to used them and refer to them.

So reporter now can choose, not to use the complete set or to be on quarter but actually just use in individual standard the most relevan to them. And still have the option of calling the report as GRI reference report.

GRI 102

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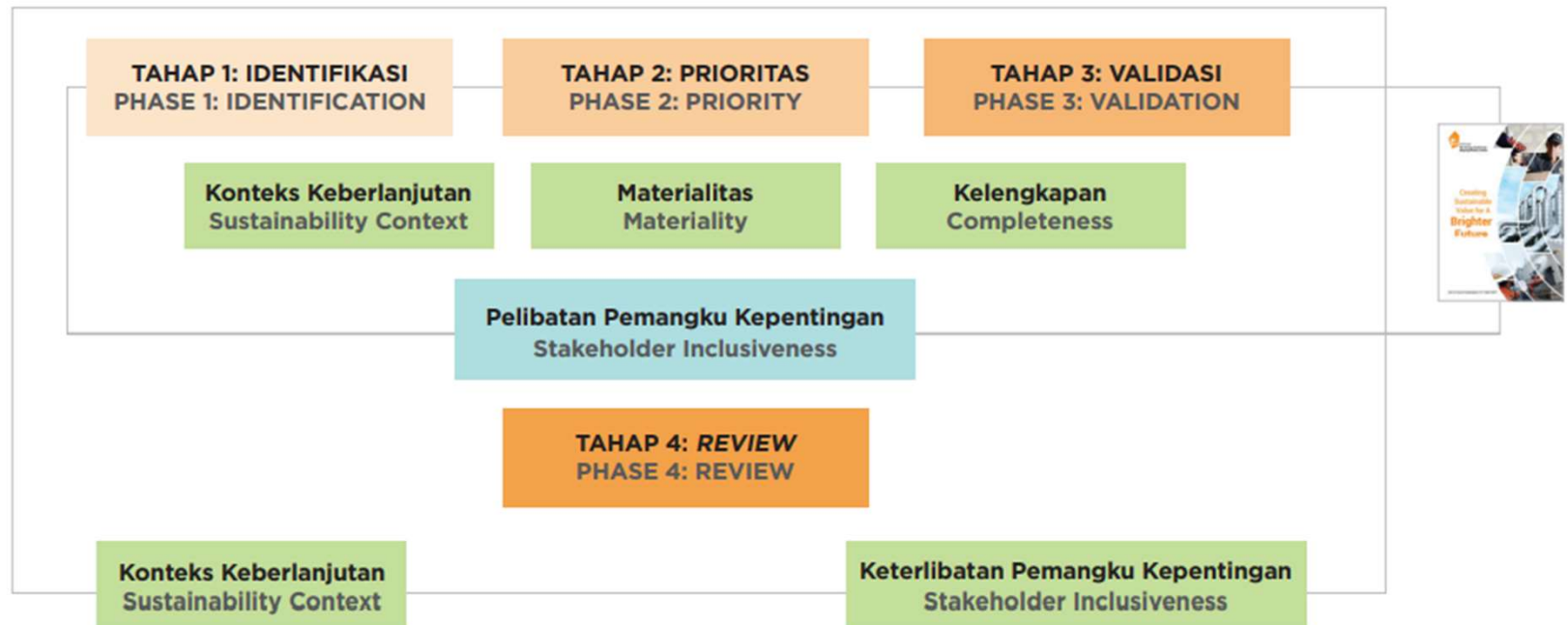
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Bagan Alir Proses Penetapan Konten Laporan Flowchart of Report Content Determination Process



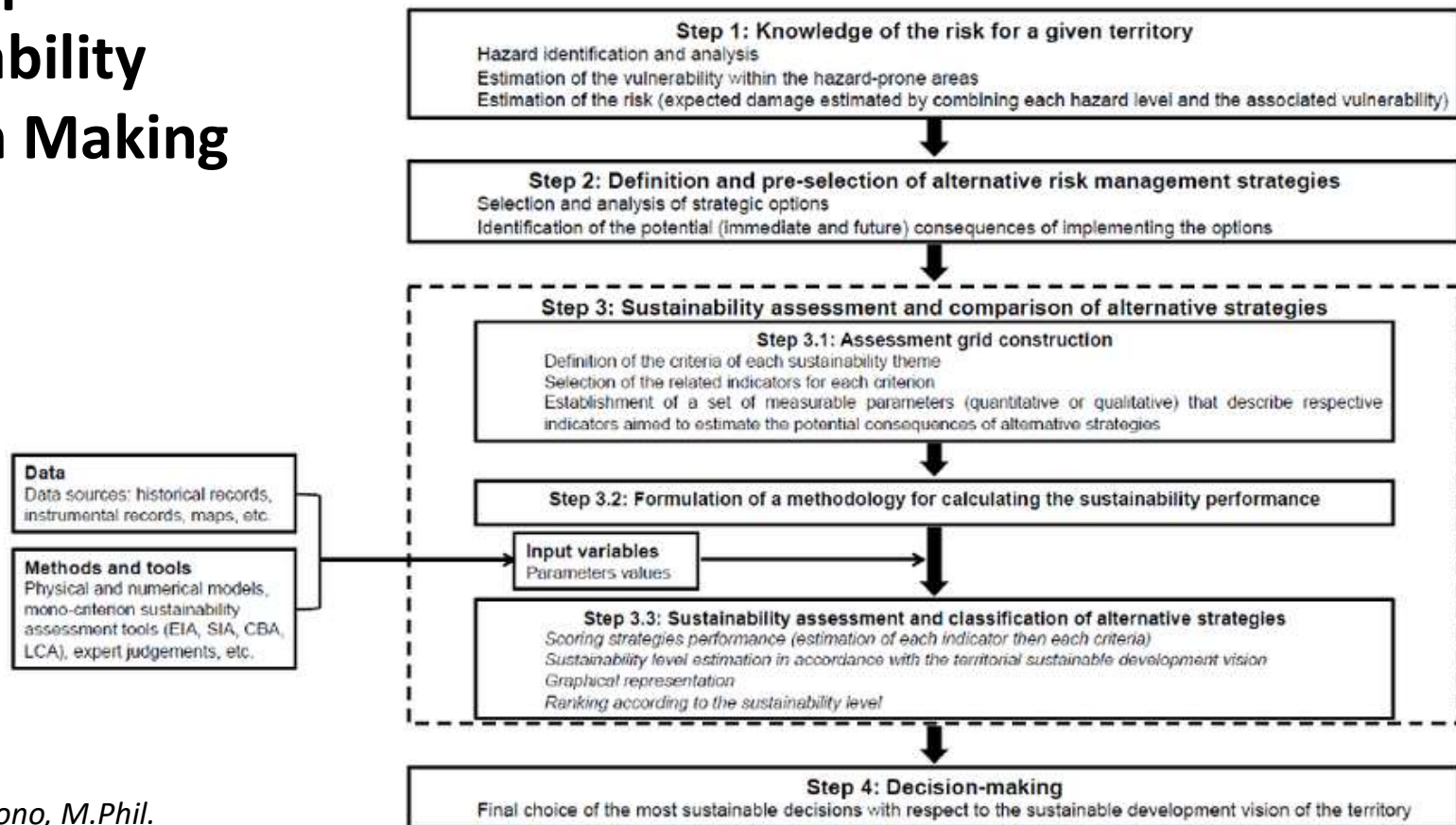


Materi Bahasan:

1. Introduction – Climate Change Policy
2. Commitment - Geothermal Operations Sustainability
3. Sustainability Indicators
4. Setting Standards for Sustainability
5. Environmental Compliance
6. Sustainability Reporting
7. Closing

Dr. Ir. Sugeng Riyono, M.Phil.

Four Steps to Sustainability Decision Making



DISCUSSION: EXAMPLE OF SUSTAINABILITY REPORT

Creating
Sustainable
Value for A
**Brighter
Future**





Matur nuwun

promote sustainable development in all its dimensions: a true integration of the environmental, social and economic aspects.

- *Sugeng Riyono – 26 September 2021*

